A Review of Electricity Regulation, Rates and Subsidy Programs in the Northwest Territories

A PUBLIC DISCUSSION PAPER

December 2008

Northwest Territories

PUBLIC CONSULTATIONS

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Copies of "A Review of Electricity Regulation, Rates and Subsidy Programs in the Northwest Territories" can be downloaded from the Energy Planning website at: http://www.nwtenergy.ca

PLEASE HAVE ALL COMMENTS SUBMITTED BY APRIL 31, 2009.

Cover Photo Source: Northwest Territories Energy Corporation (03) - Snare Rapids

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A MESSAGE FROM THE MINISTERIAL ENERGY COORDINATING COMMITTEE

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For the past few years, the Government of the Northwest Territories (GNWT), NWT residents and community governments have been actively discussing energy issues in all their complexity.

This dialogue has touched on energy costs, supply issues, opportunities for conservation and demand management, environmental impact considerations, and the increased use of alternative energy sources.

Outcomes of this process have included the publication of the NWT Energy Plan, the Greenhouse Gas Strategy and the NWT Hydro Strategy. The GNWT will be using these documents as guides as we undertake an unprecedented level of investment in energy conservation and efficiency programs, the research and promotion of alternative energy, and the development of the NWT's vast hydroelectric resources.

Northerners helped to write these guides and we are seeking your help once again as we turn to a discussion about our electricity system.

The price of electricity is a significant factor in the high cost of living in the north. This cost is a burden for individual consumers, a barrier to the continued growth of our many small communities and a limitation on our prospects for local and territorial economic development.

It is clear we need to address this issue and reach agreement on what steps will help to ensure more affordable power.

As we seek answers to these problems, we will be asking you to think about two broad questions:

What should be our vision for the future of electricity in the NWT?

What problems must we overcome to make this vision a reality?

This Discussion Paper will help guide talks with northerners over the coming months. In it, we seek to provide information about our electricity system, direct you to additional sources of information (www.nwtenergy.ca) and give an indication of some of the problems we will have to address.

Please join us and all Members of the Legislative Assembly in this important exercise.

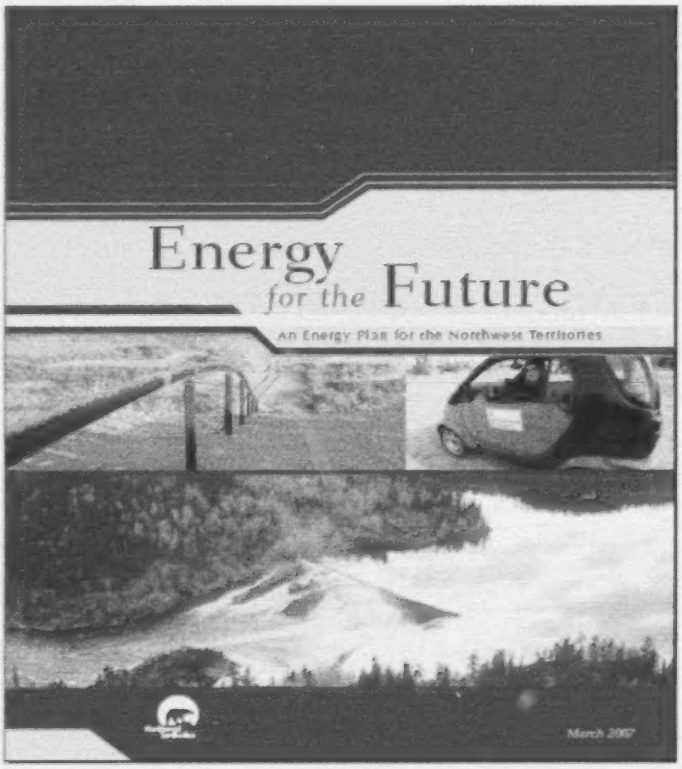
WHY AN ELECTRICITY REVIEW?

The 2007 NWT Energy Plan included a discussion of electricity issues and determined that a thorough review would benefit the north.

The Energy Plan concluded that reliable, affordable electricity should be available in all communities and noted that in pursuit of this goal, cost reducing opportunities should be explored and electricity regulation, rates and subsidies need to be reviewed.

Since that time, the price of oil, and therefore the price of diesel fuel used to generate electricity in many of our smaller communities, recently spiked to previously unimaginable levels.

While this price has fallen back, it is widely expected that it will only increase over time. This will add to the already high cost of living in our communities and makes this review both more relevant and urgent.



Source: Department of Industry, Tourism and Investment - Cover of the GNWT 2007 Energy Plan

It would be premature to set out a vision for northern electricity at this stage in the discussion – it is the development of such a vision that we are seeking your views on, after all. But, we can likely all agree that such a vision would at a minimum seek to ensure our electricity system is reliable, that its' impacts on the environment are minimized and that the costs to consumers are affordable.

Reliability

Perhaps more than any other part of Canada, the north has to be concerned about the reliability of its electricity supply.

An extended winter power outage in any of our northern communities could result in the most extreme hardship for that community and its residents. Infrastructure could be irreparably damaged, and the safety of our residents and the future sustainability of that community could be jeopardized.

For this reason our diesel communities must have redundancy built into the system. While this does add additional capital costs, it is necessary for the security of the community.

Emergency response measures are also in place to ensure that even in the event of a total system failure, electricity will be supplied under the most extreme circumstances.[1]

Environmental Impacts

The north has been experiencing the impacts of climate change more acutely than most other parts of the world. While science continues to search for more complete understanding of all the causes, the change is happening. It is incumbent upon us as NWT residents to do our best to decrease our greenhouse gas emissions.

Electricity generation has the advantage of being able to use a wide variety of energy forms including non-renewables like fossil fuels and nuclear power, and renewable sources such as hydro, wind, or biomass. This means that unlike other end users of energy, such as transportation, electricity generation can take advantage of a wide variety of available inputs right now.

Costs to Consumers

Electricity in remote NWT communities is expensive. Given the trend of rising costs, most notably oil prices, and the nature of our small, widely dispersed market, electricity will likely remain relatively expensive for years to come.

In comparison, hydro communities in the NWT experience comparable electricity rates to a number of major centres in the United States. Also, these rates are not much higher than in some cities in southern Canada. ***(See the Comparison of Electricity Rate Prices Fact Sheet at http://www.nwtenergy.ca).***

For example, residents in New York City actually pay a higher electricity rate (21.27 cents /kWh) than residents in Yellowknife (20.77 cents/kWh). Residents of Fort Smith pay a somewhat similar price (16.36/kWh) as Edmonton residents (13.45/kWh). However, in Tuktoyaktuk, the rate for 1,000 kWhs averages out to 36.92 cents. The NWT has a disparity in electricity rates.

If we are to lessen the cost burden for individual consumers in remote communities, remove a barrier to the continued growth of our many small communities and fully realize our prospects for local and territorial economic development, we need to come together as northerners to realize the goal of affordable power for all.

Simply put, this is a three step process:

- **Reduce costs where possible**
- **Distribute the costs equitably**
- **Ensure affordability**

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1 When the Fort McPherson power plant burned down during a fire in January 2004, NTPC had partial power restored within 10 hours and full power restored within 22 hours. Usually rebuilding takes approximately three years, but in this instance NTPC rebuilt the power plant in one year.

REDUCE COSTS WHERE POSSIBLE

Our electricity system contains a number of elements including the generation of electricity, transmission between power source and community and distribution within the community itself. And throughout this process, the system is regulated by the Public Utilities Board. Each stage, including the system regulation, presents opportunities for cost savings.

A discussion of NWT electricity costs first needs to consider the nature of the NWT electricity market.

The NWT Electricity Market

We are faced with a high cost environment that can in part be explained by the very nature of our physical situation. The NWT is a cold region; it is dark for much of the year; and we must import much of the fuel we use to generate electricity in our smaller communities. In addition, unlike many southern jurisdictions, we do not enjoy either of:

Economies of Scale – The NWT has a relatively small population which is spread throughout 33 communities. As a result, many of our communities are very small, yet, they still require stand-alone generation as well as all of the services required to generate and distribute electricity; or

An Interconnected Grid – The lack of any transmission connection between many of our communities, and between the NWT and other jurisdictions, limits our ability to move electricity from one location to another. From an economic point of view, this means that we cannot share the costs of generation with other customers.

From a reliability point of view, it means that communities must be self-reliant. We therefore require significant back-up systems.

To demonstrate the unique cost pressures in the NWT, we can compare our market with that of the Yukon. While overall electricity demand in the Yukon is slightly larger than in the NWT, the costs to operate their system are less than half what it costs to operate ours. This is due to the greater economies of scale in the Yukon, which has fewer communities, with all but one connected to the grid.

Electricity Companies

The Northwest Territories is served by the electrical utilities outlined in the table below.

NTPC is a regulated public utility that is effectively owned by the GNWT. The company provides nearly 100% of electricity generation in the NWT and distributes power to 45% of the population.

The two private sector distribution companies, NUL (Yellowknife) and NUL (NWT), are regulated utilities that distribute power to some 55% of the population located in six communities (primarily the largest NWT communities), but do relatively little of their own generation.

This leads to the first question for public consultations: Are there opportunities to reduce costs through changes to the structure of our electricity sector?

SERVICE PROVIDER	COMMUNITY	SOURCE
NTPC	Dettah, Fort Resolution, Fort Smith, Behchokǫ̀ (Generation and Distribution)	Hydro (8 communities)
NUL	Hay River, Hay River Dene Reserve, Enterprise, Yellowknife (Distribution)	
NTPC	Aklavik, Colville Lake, Deline, Fort Good Hope, Fort Liard, Fort McPherson, Fort Simpson, Jean Marie River, Lútselk'é, Nahanni Butte, Paulatuk, Gameti, Sachs Harbour, Tsiigehtchic, Tuktoyaktuk, Tulita, Ulukhaktok, Whati, Wrigley (Generation and Distribution)	Diesel (23 communities)
NUL	Kakisa, Fort Providence, Trout Lake, Wekweètì (Generation and Distribution)	
NTPC	Inuvik, Norman Wells	Natural Gas (2 communities)

REDUCE COSTS WHERE POSSIBLE

Electricity Generation

At present, our electricity is generated in one of three ways – hydro, diesel fuel or natural gas (diesel and natural gas use are referred to as thermal), each of which has its own economic challenges. In the case of hydro, the capital cost of developing dams and building long distance transmission lines is high while the energy source, the water, is essentially nil.

Community-based thermal plants, while expensive, are much less capital intensive than hydro facilities but the fuel cost is high and likely to remain so. Despite high fuels costs, it should be emphasized that in communities without access to hydro or natural gas, diesel is used because ***it is*** the cheapest. Reducing the cost of producing our electricity requires a long-term approach, but the immediate response is energy conservation and efficiency.

Conservation and Efficiency

It is generally agreed energy conservation and efficiency represents the greatest opportunity for reducing costs in the short-term. Studies show that conservation and efficiency can result in ten to twenty per cent in savings to the average consumer. Through the NWT Energy Plan, the GNWT has invested substantially in energy conservation and efficiency efforts, new programs, and in raising awareness, largely through the Arctic Energy Alliance (www.aea.nt.ca).

Reducing Our Dependence on Diesel

A key focus of the recently released GNWT Energy Priorities Framework (www.nwtenergy.ca) is reducing the amount of imported diesel. As outlined in the draft of the NWT Hydro Strategy (also posted on the same website), NWT hydroelectric power is one of the most promising opportunities to achieve this goal. Hydro is proven, reliable, and is insulated from volatile oil prices.

Other alternatives which hold some promise include the use of wind, biomass, solar, in-stream hydro and geothermal. While the economics and the technologies are not yet proven in our northern environment, the GNWT remains committed to investing in such long-term solutions as proven through initial technical and economic work carried out on three potential in-stream hydro projects within the NWT.

At some point, a Mackenzie Valley pipeline will become a reality and some communities along its route may be able to get access to the natural gas as it moves south.

When the Town of Inuvik converted to natural gas from the nearby Ikhil field, the GNWT, Inuvik Gas and the consumers worked together to ensure as complete a conversion as possible.

This effort included the NTPC power plant and government building conversions and support to individual consumers to convert their homes to natural gas. NWT natural gas will likely always remain less expensive than imported dies and is therefore another option to be considered in reducing our electricity generation costs in the long term.

Private Public Partnerships

Capital costs are a major barrier to the development of large-scale power projects, yet these projects could have long-term cost benefits to the NWT economy as discussed in the Draft NWT Hydro Strategy.

Government cannot always afford the hundreds of millions of dollars in required capital costs and private developers are reluctant to take on all the risk, so there may be a role for public-private partnerships in future development.

Export Markets

Large-scale hydro projects need large markets in order to provide the lowest possible unit costs. Hydro-power sold to the NWT's diamond mines is one example of creating a larger market to benefit from economies of scale.

Likewise, exporting power to Alberta would increase the market size, again to the benefit of NWT residents. Again, this may be a solution in the very long term.

What other areas need to be examined in order to try and lower the cost of electricity generation?

REDUCE COSTS WHERE POSSIBLE

ELECTRICITY TRANSMISSION AND DISTRIBUTION

Transmission

Long distance transmission is generally considered to be a form of "natural monopoly." The nature of the market is such that competition between service providers isn't economically feasible.

For example, when natural gas is produced in the Delta, it won't be cost effective for two competing pipelines to ship the gas to the south. The high capital cost of the pipelines, coupled with the relatively small amounts of gas to be shipped, just wouldn't allow both pipelines to pay their way. The market will only support one.

Long distance electricity transmission is similarly limited in the opportunities for competition.

Distribution and Delivery

Because so many of our smaller communities are served by stand-alone power plants, some have questioned the value, and the cost, associated with being part of the larger NTPC system.

Could a community realize cost savings by owning and operating its own power generation and delivery system while retaining the same level of reliability and safety? If so, how?

Benefits of the larger NTPC system include fuel purchasing power and the corporation's ready access to items such as emergency response systems, government-guaranteed capital, and to qualified, experienced technical trades-people.

Source: Northwest Territories Energy Corporation (03) - Snare Hydro Transmission Line

REDUCE COSTS WHERE POSSIBLE

ELECTRICITY REGULATION

The Public Utilities Board is a quasi-judicial Board that has broad powers in reviewing and establishing electricity rates and has sole jurisdiction over the regulatory process in the NWT.

Electricity rates are established by a lengthy General Rate Application (GRA) process that typically occurs once every three years. GRA hearings are open, invite public involvement, and deal with a tremendous amount of information on the utility's assets, operations and financial affairs.

There are two phases to this process:

During **Phase One**, intervenors representing consumers seek to scrutinize the overall revenue requirement and determine if there are elements of the forecasted costs that are not necessary to provide service.

The purpose of **Phase Two** is to determine the specific rates that each type of customer will be charged. Phase Two can see individual customer classes, and sometimes communities, making a case to minimize their individual rates, often at the expense of other customer classes or communities.

This process can be both adversarial and expensive.

Cost of Regulation

The average annual cost to run the Public Utilities Board is approximately $500K. The funding for this is provided by the government budget process and has no impact on the cost of electricity in the NWT.

There are however, significant costs for the utilities to take part in the General Rate Application process. For example, NUL (NWT) and NUL (Yellowknife) spent a combined $900K on their recent applications before the PUB and NTPC spent $2.2M on its application. These costs are ultimately paid for by the consumer.

The challenge is to try to reduce the costs of regulation on the utilities, and ultimately the consumers, while maintaining the appropriate degree of regulatory oversight.

Intervenors can bring an important perspective to the regulatory process, a perspective that also brings costs. Another challenge is to ensure this perspective continues to inform the regulatory process while limiting its impact on rates.

Are there opportunities to reduce the costs of regulation?

Role of the Public Utilities Board

The PUB process provides individual members of the public with a forum to directly participate in the rate-setting process. The extensive review is designed to provide consumers with a level of comfort that their electricity rates are just and reasonable.

However, there may be issues dealing with broad public policy that should be decided by government and implemented by regulatory agencies.

In developing this discussion paper the government has benefitted from the comments of a number of observers who believe there is a need to more clearly define the role of government to provide direction on electricity policy issues.

While the Board currently reports to the Minister responsible for the Public Utilities Board, wording of Section 14 of the *Public Utilities Act*, does not specify to what extent the GNWT Cabinet can issue directives to the Board. The lack of clearly stated authority regarding policy direction can result in some issues not being addressed. The Board itself has made this observation on a number of occasions.

Other jurisdictions in Canada do provide for policy direction from government to utility regulators. **(See Fact Sheets at www.nwtenergy.ca)**

Should the GNWT be able to issue policy direction to the PUB?

EQUITABLE COST DISTRIBUTION

ELECTRICITY COSTS

While the objective is to realize a number of cost savings during this exercise, the NWT electricity system will remain an expensive one to operate and maintain.

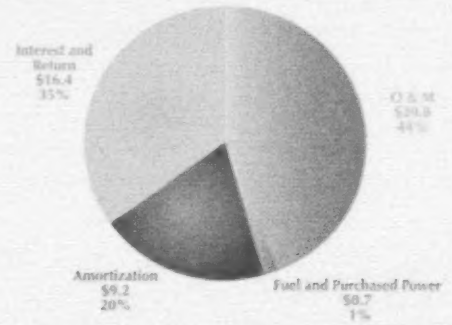
During the 2007/2008 fiscal year, the total cost to run the NWT electricity system was nearly $100 million with approximately half of that cost required to service hydro communities and the balance to service diesel communities. The total costs for both hydro and thermal communities are illustrated in the two pie charts below and are broken down as follows:

- 20.2 cents average cost X 233 million kWh = $47M for hydro communities, and
- 64.9 cents average cost X 77 million kWh = $50M for thermal communities.

At present, the PUB establishes an electricity rate for each individual community, and class of service within that community, directly related to its cost of generating electricity. This means that communities with a higher unit cost of generating electricity must pay a higher rate for that electricity.

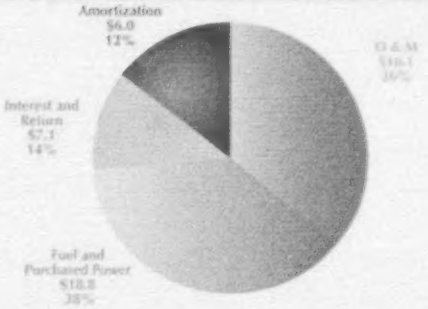
This method of rate design has given rise to much discussion over the years. It has been suggested that existing community based rates do not reflect historical federal government investments in hydro and therefore the costs of the system are not equitably distributed.

NWT HYDRO COMMUNITIES (IN MILLIONS OF $'S)



TOTAL GENERATION COST - $47.1 MILLION OR AN AVERAGE COST OF 20.2 CENTS PER kWh

NWT THERMAL COMMUNITIES (IN MILLIONS OF $'S)



TOTAL GENERATION COST - $50 MILLION OR AN AVERAGE COST OF 65 CENTS PER kWh

Source: Northwest Territories Power Corporation and Northlands Utilities Ltd.

EQUITABLE COST DISTRIBUTION

Some observers have suggested we move to a one-rate zone that would see the NWT's total electricity generation costs divided by the total output to arrive at a unit price (levelized rates) that would be equally applied to all consumers. This would result in a higher rate for communities currently served by hydro and a lower rate for communities served by diesel.

Referring to the figures on the previous page, if the costs across the north were to be averaged across the entire system, rates in the NWT would need to be in the range of appoximately 31 cents/kWh ($97 million/310 million kWh = 31.3 cents).

The magnitude of the problem can be demonstrated by considering the impact if all communities were just charged the average hydro rate. Bringing the average thermal community rate down to the average hydro rate would result in a $34 million revenue shortfall.[2]

Maintaining the $10 million GNWT investment in the Territorial Power Subsidy Program (TPSP), and not reducing rates to government customers would reduce this shortfall to $14 million, a significant decrease but still a substantial shortfall.

Others have argued for two rate zones, one applied to all communities supplied by hydro and the other applied to all communities supplied by diesel. If this model were adopted, we would see some redistribution of costs among the diesel communities and some among the hydro communities, but not between the two systems.

[2] Average thermal rate of 64.9 cents minus average hydro rate of 20.2 cents = 44.7 cents. 44.7 cents multiplied by the 77 million kWhs consumed by thermal communities = $34.4 million

Given the above examples, it is easy to see that there is no easy solution to moving away from our complex, community-based rate system. Ultimately, the electricity rate structure needs to be based on the values and principles held by northerners. The degree of reliability we pay for, the efficiency of the entire system, and the amount of administrative complexity are also issues that need to be considered in designing our electricity rate system.

One approach utilized in other jurisdictions such as Newfoundland and Labrador and the Yukon is the concept of a conservation rate. Essentially, prices are levelized for the first 1,000 kWhs.

The NWT currently has this type of system in place for the first 700 kWhs, but perhaps this could be expanded to include NWT businesses?

Should the NWT move towards a more simplified, levelized rate structure?

There may be other alternatives available. We would like to hear your thoughts about the models we have discussed above and any others that you think should be considered.

ENSURING AFFORDABILITY

ELECTRICITY SUBSIDY PROGRAMS

As mentioned, the TPSP provides for customers outside Yellowknife to pay the same rate as Yellowknife residents for the first 700 kWh used. In 2008, the total cost of this subsidy to the GNWT was $10M, having more than doubled over the previous eight years.

The TPSP also provides a subsidy for qualifying small businesses. However, the program for businesses is application-based, very restrictive in that it applies only to the first 1,000 kWh of monthly consumption, and is not very accessible. As a result, it only applies to approximately 3% of NWT businesses. In 2008, the total cost of this subsidy was $250K.

The TPSP will have to change to respond to any proposed new approach to electricity rates. Ultimately, moving towards levelized rates can be achieved solely through enhanced government subsidies, but this is likely not affordable for the GNWT.

One area where it appears that the TPSP will need to change is for commercial customers.

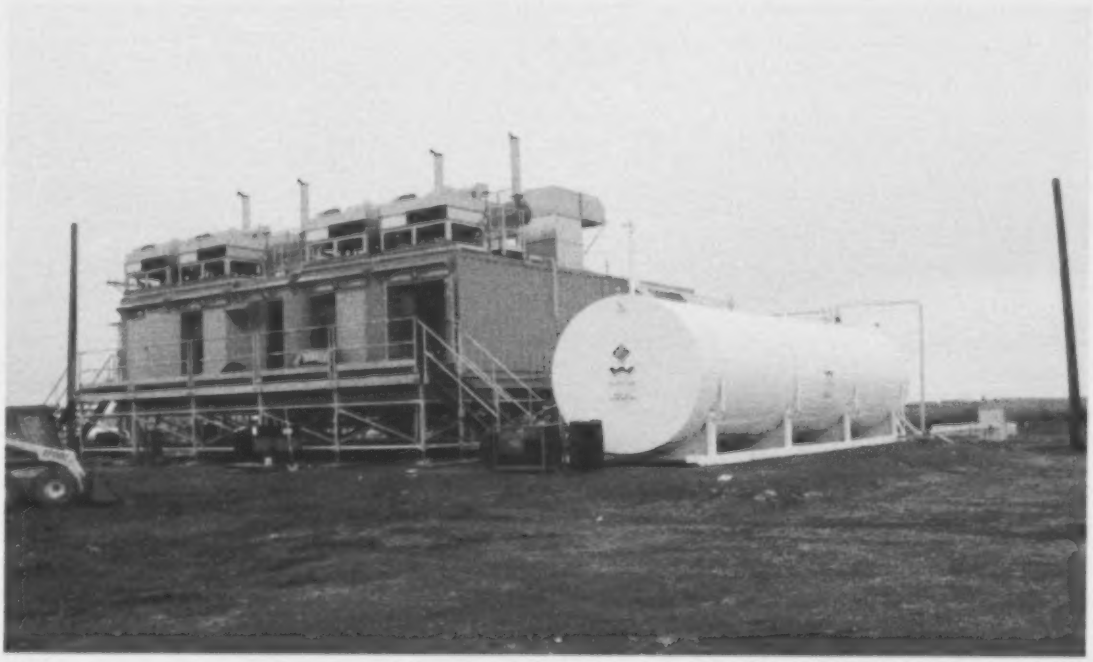
Commercial Customers

There are two possible reasons why power subsidies may be required for commercial customers throughout the territory.

In the first instance, in many diesel powered communities, a business may be the most significant user of electricity. If such a business decides to leave the local grid and generate all of its heat and power needs independently, the economic impacts on the remaining customers would be significant, as the fixed costs of the community system need to be recovered.

In order to discourage companies from leaving the grid, it may be necessary to continue some form of subsidy in order to reduce the costs for these businesses.

In the second instance, the high cost of power may act as a barrier to local economic development. The provision of a subsidy to help businesses reduce their electricity costs may be necessary in order to attract new businesses to a community, help to maintain the existing ones, and lower the overall cost of living.



Source: Northwest Territories Energy Corporation (03) - Aklavik Diesel Power Plant

CONCLUSION

As NWT residents, we are fully aware of the burden on our residents, our businesses and our communities of the high cost of energy. The members of the Ministerial Energy Coordinating Committee, Members of the Legislative Assembly, Community Governments and the public need to work together to try and lessen this burden.

Each one of us has something useful to bring to this exercise and we encourage you to share with us your ideas for a vision for the future of electricity in the NWT and your thoughts on the problems we must overcome to make this vision a reality.

This Discussion Paper has suggested a three-step process to help deal with the costs of electricity to consumers. We are seeking your advice on how to reduce costs, how to distribute these costs as equitably as possible and how to ensure electricity is affordable for all.

To this end, we are seeking your comments on opportunities to reduce the costs of electricity generation, transmission and distribution.

We also look forward to hearing from you about how best to reduce the cost of regulation while maintaining a regulatory system that ensures that NWT residents receive value for their money.

In addition to redu .ng the costs of our electrical system, it is important that we work together to ensure that all benefit from this system and communities are provided equitable access to power.

Our final challenge is to try to establish a cost for electricity that is as affordable as possible for NWT residents.

Source: Northwest Territories Energy Corporation (03) - Snare Forks